Notebook Series -- Notebooks by Edison
Notebook, N-17-07-11

This notebook is probably a continuation of N-17-00-00.8. It was used by Edison and Jerry T. Chesler in July 1917 to record wartime research for the U. S. Navy on the amplification and detection of sound. Included are experiments with carbon buttons for telephones used in experimental amplifying devices and experiments with the telephone receivers used as transmitters, as well as tests for electrical resonance within related circuits. The notes indicate that Sherwood T. (Sam) Moore and Charles T. Dally assisted Edison in some cases. The front cover is labeled "No. 6." The pages are unnumbered. Approximately 25 pages have been used.

July 11th 1917

Experiments with Carbon bullons for Carbon Telefone

Metallic discs coated over with a very Thin film of Conducting Lamp Black

1 or more bullons, Under sea receiver —

India Ink seems to be free of specs of Lamp Black its in a Cement like Dextrin when it dries on glass

or porcelain it is not
rubbed off by fingers —
When thin it is light
brown —

Grinding Lampblack
with Gelatin its impossible
get clots out & it also
Rubs off —

With Dextrin can get
most clots out & it
acts like india ink
but it tends to rub
off — if Alum or acid
it Coagulates & the
Lampblack goes into

Clots as original = This is very striking + shows Care must be taken to prevent Coagulation by Electrolytes —

Grinding in little agate mortar Glycerine + Lampblack brands clot up perfectly — no Electrolyte Dont dry of Course

India ink - few drops poured into water & very much diluted shows brown, not clots, its drying on glass & porcelain - Think this will be good if Conductor OK

Our blank Varnish blanked & Resin - NG as blanked Evaps leaves neither & this Clots it with Resin - Rubber -

Record face Var works OK clots disappear Except dont dries quick wks very dilute dont rub off - fear too much lead in it,

Have made films across glass to measure —

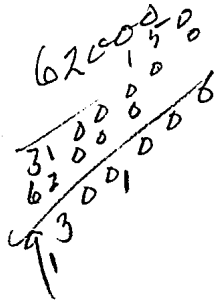
Only the Record Vacuum gives a click in phone, when 2 cells opened in primary — the phone + secondary in ckt —

glycerine + lampblack is best or loudest but probably due to water in glycerine

Probably Res more than Several Megohms —

If as a button, it would probably be 1000 ohms or more —

Moores buttons
1/2 lb pressure 41 @ 65/100 of ohm —
With weight of disc only 76 ohms, variable by jars —
2 Lampblack surfaces together,
We now with Scales starting with 10 grams weight gradually diminish weight to get a Curve



A Moore button covered poorly with Lampblack and Silicate Soda gives with 1/2 lb pressure 62000 ohms - against 10 megohms 1" across glass or 155 times less on button,

Tried Moore button with milliamp meter -

Very irregular - can go up to 50 milliamp + down to 2 milliamp by pressing -

5 grams generally makes
def of 2 Mil amp.
Three in Series not as good
as a single button —
Apparently air film interferes
as noticed one button which
to the other Moors got
Warm Very fast. + also
Lamp & Lack put on by
electroplating due to
strong hydraulic pressures
We are trying to remove
the air defect by Scraping
Lamp off as remainder

is in squares 1/32 to 1/16

The white representing the Lampblack spots, This shaped remains the air film trouble —

This is more sensitive so 500 mlg shows 2 mil amp change 1 gram Record McGuinlin but it was against a complete Carbon Microphone not a Carbon Button

Edison Can hear the wheel sound to 1/10th of a Milamp passing thru a primary

1 cell storage battery (Minus)
primary 260 ohm
Secondary 2800 –

Put cell in without coil –
1200 ohm brought it to
1 Milamp – I could hear it
easy with 11000 ohm in
Can hear probably $\frac{1}{12}$ to
$\frac{1}{15}$ of a Milliampere –

We trimmed wick of Kerosene
lamp & burned

Some Lampblack the old way once used in Early days for Transmitter bulbs — The black was intensely black and a very fine conductor several times better than that burned by Dally

The Kerosene Lampblack is very sensitive to pressure it Cakes together on pressure & I think we can make small bulbs 1/8 X 032 thick that can be handled

One thing is certain we must get the pressure disc operated by phone lever so it bears even on the lampblock otherwise it tends & just as likely weaken cement when pressure applied as to strengthen it —

Monday July 16 – 1917

Tests to determine sensitiveness of long bell receiver used as transmitter.

Aparattus used Amberola 30 - with blue Amberola record playing Smiles, Then Kisses" Waltz. Phonograph is set in a ~~co~~ box padded with cow hair and has only one opening in front $\frac{11}{16}$" in diam. The box containing phonograph is set up to about the same level

as transmitter under Test and directly in line with same. The line from transmitter is run to Chemical storehouse building where the sound is received on another Bell receiver.

In all tests the phonograph is moved further and further away from transmitter until the music can no longer be heard on receiver in the neck building.

~~Test with transmitter #1~~

*Mark can be found under diaphragm scratched in brass bell. This was done so that if [redacted] transmitter is removed from rubber shell it can still be identified.

Transmitter #1 test.

Test conducted under general noisy condition prevailing around 4 P.M.

~~Ob~~ With phonograph 6' ft away from transmitter could just about make out tune.

Phonograph 7ft away could not get entire tune the predominating notes only being plainly heard.
Phonograph 11ft away practically entirely gone. Could hear the phonograph at all.

Test with Bell Transmitter #2 Under same conditions as Transmitter no. 1. about 4.30 PM.

With phonograph 6ft away from transmitter could just about make out tune.

Phonograph 7ft away could

not get entire tune same as in test on first transmitter Phonograph 11 ft away could not hear tune at all — nothing.

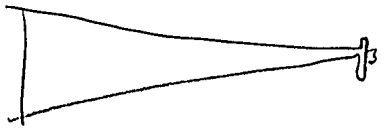
Test with Bell Transmitter #3 under same conditions as last two. 5 P.M.

With Phonograph 5 ft away from transmitter could just about make out tune. Phonograph 6 ft away could

not get entire tune the predominating notes only being plainly heard.

Phonograph 10 ft away, can't hear the phonograph at all

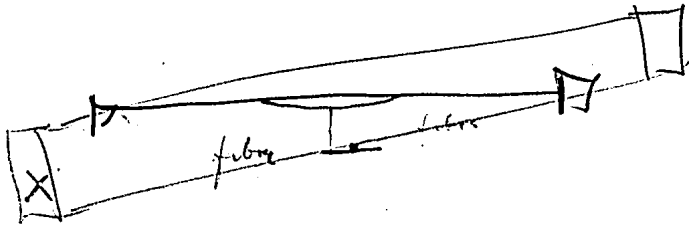
July 19



We now have gold leaf skin with lens & pin working a mirror, all in Controlled magnetic field —
Skin too tight not sensitive but at 760 MA got spasmodic — vibrations of light twice resonance 3 times its decimals
Cant say where this sound comes from

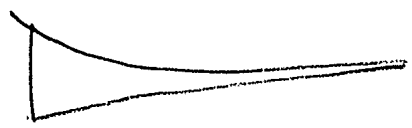
The point to move mirror is v.g. too much friction

We Connected Diaphragm to mirror by a single fibre of silk. This made it OK



Then we swivelled the field magnet a little to put tension of the mirror & diaphragm fibre —

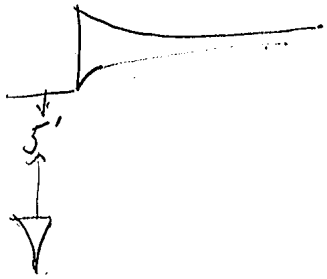
The turning is high 15 to 30
Cant say yet, it moves
5 to 6". but unsteady as
air is unsteady —
The sound coming from
Siren + use of my speaking
funnel 2½ ft away
laying on table



Siren funnel

We now move siren

funnel 5 ft away
from Mouth of funnel
of Mirror =



with air wave disc
running at 8 impulses
per second tuning on
galvanometer is at
250, 500, and 960
Mile ampere.

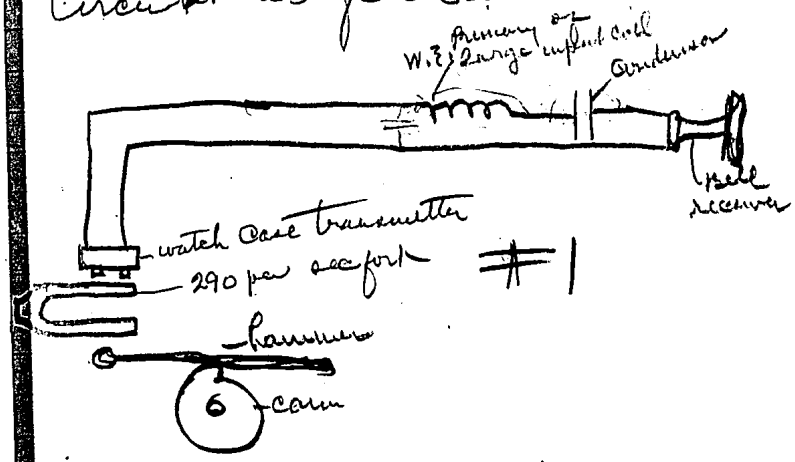
405 Ma tuning
Microphone 6 Coils
Multiple in parallel
6 Coils series in
Secondary — Big
Output Coil +
Microphone 3 @ 4 ft
away zero to 12"
throw throw —

3 & Rev on Screen
(12 holes) 3/4 lb
pressure — funnel

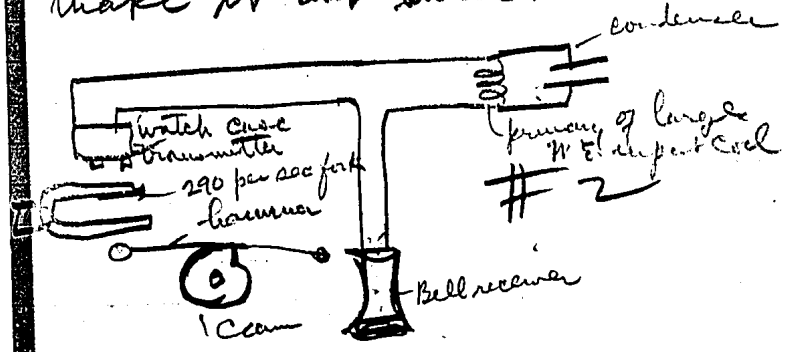
Tuesday July 24/17

Tests for Electrical Resonance

Circuit as follows.



Adjusted fork 3/8" nick from magnetic phone. direct could just barely hear fork in Bell receiver

Inserted inductance using secondary of large W.E. Induct. coil

in series with Condensors but could hear nothing. Cut out secondary and introduced primary of same coil in circuit and tuned condensers to .74 micro farad, could hear fork plainly where could just barely make it out direct